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| 23552 | 7590 | 11/18/2003 | EXAMINER | |
| MERCHANT & GOULD PC P.O. BOX 2903 MINNEAPOLIS, MN 55402-0903 | | | PRITCHETT, JOSHUA L | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2872 | |

DATE MAILED: 11/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/913,018

Applicant(s)

YOSHIKAWA ET AL. ✓

Examiner

Joshua L Pritchett

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION:

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-10,15,32-34,41,97,99 and 102 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

- 5) ☐ Claim(s) _____ is/are allowed.

- 6) ☒ Claim(s) 1,2,4-6,15,32-34,41,97,99 and 102 is/are rejected.

- 7) ☒ Claim(s) 3 and 8-10 is/are objected to.

- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.

- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☒ All b) ☐ Some * c) ☐ None of:

1. ☒ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.

4) ☐ Interview Summary (PTO-413) Paper No(s) _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other:

DETAILED ACTION

This action is in response to Response filed September 27, 2003. All applicant's arguments have been considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 15 and 99 are rejected under 35 U.S.C. 102(b) as being anticipated by Abel (US 3,811,749).

Regarding claim 15, Abel discloses a reflective optical device comprising at least three reflection surfaces (18, 20 and 62) for bringing light fluxes from an object into focus on an image surface (P2) wherein the reflection surfaces are arranged eccentrically (Fig. 2). Abel further discloses among the reflection surfaces, the reflection surface placed second from the object side in a direction in which the light fluxes travel is given as a second reflection surface (Fig. 2) and the second reflection surface is concave (Fig. 2) in a cross sectional shape taken in the vicinity of its vertex along a plane containing vertices of the reflection surfaces, and its convex in a cross-sectional shape taken in a direction perpendicular to the plane (Fig. 2).

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Regarding claim 99, Abel discloses wherein the reflection surfaces are for surfaces (18,20,62 and 43) that are a first surface, a second surface, a third surface, and a fourth surface in an order from the object side in a direction in which the light fluxes travel (Fig. 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5-6 and 97 rejected under 35 U.S.C. 103(a) as being unpatentable over Abel (US 3,811,749) in view of Ohzawa (US 5,993,010).

Regarding claim 1, Abel discloses a reflective optical device comprising two non-axisymmetric reflection surfaces (18 and 20) for bringing light fluxes from an object into focus on an image surface (P2). Abel further discloses the two reflection surfaces being in a first reflection surface (18) and a second reflection surface (20) wherein the first and second reflection surfaces are disposed in this order in a direction in which the light fluxes travel and are arranged eccentrically (Fig. 2). Abel further discloses each of the first and second reflection surfaces is concave (Fig. 2) containing a center of the image surface and vertices of the reflection surfaces. Abel lacks reference to the reflection surfaces being non-axisymmetric. Ohzawa

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teaches the use of non-axisymmetric members in a reflecting array (col. 11 lines 43-47). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Abel reflecting surfaces be non-axisymmetric as taught by Ohzawa for the purpose of correcting ray aberrations due to oblique reflection.

Regarding claim 5, Abel teaches the invention as claimed but lacks reference to the non-axisymmetric reflectors and their shape. Ohzawa discloses the first reflection surface is concave in a cross-sectional shape taken in a direction perpendicular to a plane containing the center of the image surface and the vertices of the first and second surfaces (Fig. 8). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the reflectors of Abel have the shape taught by Ohzawa for the purpose of correcting ray aberrations due to oblique reflection.

Regarding claim 6, Abel teaches the invention as claimed but lacks reference to the non-axisymmetric reflectors and their shape. Ohzawa discloses the second reflection surface is concave in a cross-sectional shape taken in a direction perpendicular to a plane containing the center of the image surface and the vertices of the first and second surfaces (Fig. 8). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the reflectors of Abel have the shape taught by Ohzawa for the purpose of correcting ray aberrations due to oblique reflection.

Regarding claim 97, Abel teaches the invention as claimed but lacks non-axisymmetric reflection surfaces. Ohzawa teaches the use of non-axisymmetric members in a reflecting array (col. 11 lines 43-47). It would have been obvious to a person of ordinary skill in the art at the

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time the invention was made to have the Abel reflecting surfaces be non-axisymmetric as taught by Ohzawa for the purpose of correcting ray aberrations due to oblique reflection.

Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abel in view of Ohzawa as applied to claim 1 above, and further in view of Cook (US 4,834,517).

Regarding claim 2, Abel in combination with Ohzawa teaches the invention as claimed but lacks reference to a diaphragm located before the first reflection surface. Cook teaches a diaphragm (26) located before the first reflection surface on the object side. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the Cook diaphragm in the Abel invention for the purpose of filtering out an excess and scattered light to obtain a signal with less error.

Regarding claim 4, Abel in combination with Ohzawa teaches the ratio of the distance between the first and second reflection surfaces and the focal length to be between 1.0 and 4.0 (Fig. 2). L_1 and L_2 are the focal lengths of both of the reflection surfaces and are the same value and the reflection surfaces are located a distance L_1 plus L_2 apart, therefore claimed ratio gives the value of 2.0 which is between 1.0 and 4.0.

Claims 32-34, 41 and 102 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abel in view of Ohzawa as applied to claim 1 above, and further in view of Willey (US 5,841,574).

Regarding claims 32 and 102, Abel in combination with Ohzawa teaches the invention as claimed but lacks reference to the detector converting the optical signal to an electrical signal.

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Willey teaches the use of an electro-optic detector (col. 8 line 67 – col. 9 line 1). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the detector in the Abel invention convert the optical signal to an electrical signal for the purpose of precise measurement of the incoming data.

Regarding claim 33, Abel in combination with Ohzawa teaches the invention as claimed but lacks reference to the detecting means being a two-dimensional imaging element. Willey teaches the use of a camera as the detecting means (col. 8 line 67 – col. 9 line 1). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the camera taught by the Willey reference in the Abel invention for the purpose of creating a record of the data collected.

Regarding claim 34, Abel in combination with Ohzawa teaches the invention as claimed but lacks reference to the detecting means being sensitive to infrared radiation. Willey teaches the detector being sensitive to infrared radiation (col. 9 lines 4-7). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Abel detecting means be sensitive to infrared radiation as taught by Willey for the purpose of expanding the usage of the invention to include a wider range of information.

Regarding claim 41, Abel in combination with Ohzawa teaches the invention as claimed but lacks reference to the display being conveyed to a driver. Willey teaches a display means to convey the obtained image to a driver. A camera inherently has some means of display because of the use of some type of recording medium and a driver may include a person developing or observing the recording medium of the camera. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to include in the Abel invention a

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means of conveying the obtained image as taught by Willey for the purpose of data analysis and interpretation.

Allowable Subject Matter

Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record fails to teach or suggest the claimed relationship between the distance of the diaphragm to the first reflection surface and the focal length of the device.

Claims 8-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record fails to teach or suggest making the non-axisymmetric reflecting surfaces into toric shapes.

Response to Arguments

Applicant's arguments filed September 28, 2003 have been fully considered but they are not persuasive.

On page 2 of Response, applicant argues that Abel lacks the use of free form shapes and that Ohzawa lacks the use of reflective elements to focus light and that the combination of the two references is not obvious. The examiner disagrees both Abel and Ohzawa use optical

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elements to focus light beams. Able uses a series of reflective elements and Ohzawa uses non-axisymmetrical optical elements to reflect and focus the light. In the Ohzawa reference the examiner is not directing the rejection to the use of the reflective arrays (16 and 26) but merely toward one reflective element in each of the arrays. As is clearly shown in Fig. 8 light comes from source and is then incident upon a first reflective element (160) which as a non-axisymmetric surface as discussed in the rejection of the claim, the light is then reflected to a second reflective element (260) which has a non-axisymmetric surface and focused upon a plane (4). The use of a non-axisymmetric surface on two reflective elements to focus light is shown in Ohzawa and one of ordinary skill in the art would recognize that it would be obvious to use the teachings of Ohzawa to modify the teachings of Abel because the two references are of similar fields of endeavor.

On pages 3-4 of Response, applicant argues that Abel lacks the concave second reflector. The reflectors listed in the argument are 60 and 42, while the reflectors used in the rejection are 18, 20 and 62. The examiner feels the rejection is proper as Fig. 1 shows reflector 20 to be concave.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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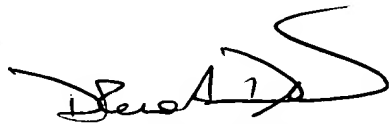
MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L Pritchett whose telephone number is 703-305-7917. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A Dunn can be reached on 703-305-0024. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JLP



DREW DUNN
SUPERVISORY PATENT EXAMINER